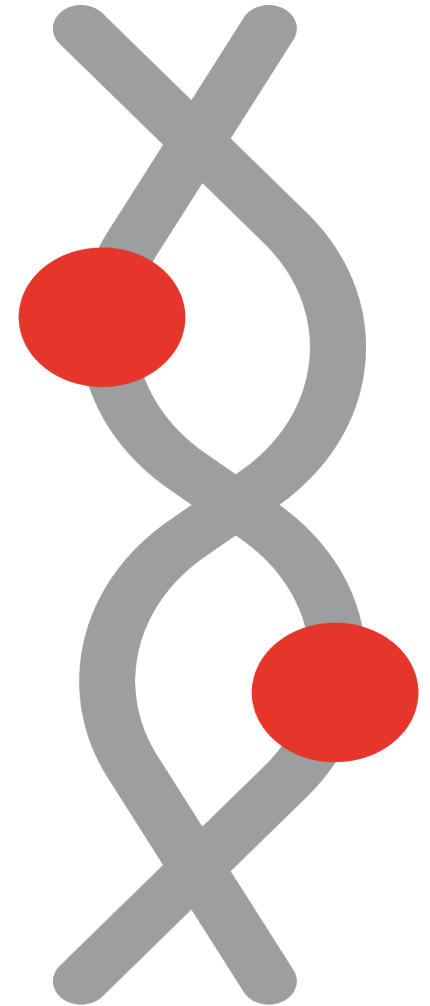




Fagron

genomics



Gene Comprehensive Nutrigenomic Report

Accession Number: #####

Specimen Collected: ##/##/####

Specimen Received: ##/##/####

Report Generated: November 17, 2022

Specimen Type: Buccal Swab

Provider: #####

Patient Name: #####

Patient DOB: ##/##/####

Patient Gender: Male

Do not make any decisions about your health solely based on the information contained in this report. Always consult with a licensed and experienced health practitioner when you receive this report.

– 36 – Male

(-/-) No clinical abnormality

(+/-) Heterozygous result

(+/+) Homozygous result

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
DETOXIFICATION Complete							
rs1021737	CTH	-/-	N-Acetyl Cysteine (NAC), Glutathione				
rs819147	AHCY	-/-					
rs1002149	GSR	+/-	Riboflavin, Reduced Glutathione			Be Cautious With Ozone or Hydrogen Peroxide Therapy Routine Eye Exams For Cataracts after Age 50	
rs1056806	GSTM1	-/-	Glutathione				
rs7483	GSTM3	-/-					
rs1695	GSTP1 I105V	+/-					

– 36 – Male

(-/-) No clinical abnormality

(+/-) Heterozygous result

(+/+) Homozygous result

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
rs4998557	SOD1	-/-					
rs4880	SOD2	+/-	High Dose Antioxidants, Curcumin, Sulforaphane, Vitamin C	N.A.S. Enhancer™	Consider High Dose Vitamin C Therapy	Consider high antioxidant diet (fruits and vegetables)	
rs2855262	SOD3	+/-					
rs1208	NAT2	-/-	Silymarin, Alpha Lipoic Acid (ALA), P-5-P, Catechins				
rs8177412	GPX3	+/-	Selenium	Selenomethionine 200 mcg. day High Dose Anti Oxidants		Be Cautious With Ozone or Hydrogen Peroxide Therapy Consider high antioxidant diet (fruits and vegetables)	
rs1805087	MTR	-/-	S-Adenosyl Methionine				

Summary for Detoxification

Highly Recommended Therapeutics

- N.A.S. Enhancer™
- Selenomethionine 200 mcg. day
- High Dose Anti Oxidants

Provider Discretion: As Needed Formula Recommendations

- Consider Glutathione Therapies
- Consider High Dose Vitamin C Therapy

Lifestyle Recommendations

- Be Cautious With Ozone or Hydrogen Peroxide Therapy
- Routine Eye Exams For Cataracts after Age 50
- Consider high antioxidant diet (fruits and vegetables)

Laboratory Recommendations

DETOXIFICATION

GLUTATHIONE IN DETOXIFICATION

Relevant genes for production are AHCY, CTH, GSTP1, GSTM1, GSTM3, GSR, MTRR & MTR

WHY IS IT IMPORTANT?



Maintains health by protecting the body from toxins



Regulates cell production and programmed cell death



Critical role in chemical detoxification



Vital for proper mitochondrial function



WAYS TO INCREASE GLUTATHIONE

- Limit alcohol intake
- N-acetyl-cysteine (NAC)
- Glutathione therapies
- (ie. IV Glutathione, Glutathione suppository, Liposomal Glutathione)
- Include whey in diet, unless allergic or intolerant
- Methylation Support - if necessary

SUPEROXIDES & ANTIOXIDANTS

- SOD1, SOD2, SOD3 genes are important to transform superoxides to protect against mitochondrial damage
- Reactive Oxygen Species (ROS) can damage mitochondria and cause cell death.
- Antioxidants such as Vitamin A, Vitamin C and Vitamin E act as a defense against ROS

DEFICIENCY CAUSES

- Auto-immune diseases
- Cardiovascular diseases
- Neurodegenerative diseases
- Cell death
- Poor mitochondrial function

HIGH ANTIOXIDANT DIET

BENEFITS



Protection from oxidative stress



Helps reduce risk of heart disease, cancers & diabetes



Helps maintain functions of the liver, kidney, brain and digestive system



FOODS HIGH IN ANTIOXIDANTS



Dark chocolate



Spices/herbs
(cinnamon, oregano, turmeric, cumin, sage, thyme)



Fruit (berries, red grapes, prunes, apples, cherries, black plums)



Whole grains
(unless gluten free)



Vegetables (artichokes, beets, dark leafy greens)



Nuts (pecans, walnut, hazelnut, pistachios, almonds, cashews, macadamias)



Beans
(pinto, red, kidney, black)



Beverages: juices
(apple, tomato, pomegranate, pink grapefruit juice), teas (green, black)

Gene Information Key

rsID	Gene	"-" variant	"+" variant
rs819147	AHCY	T	C
rs1021737	CTH	G	T
rs8177412	GPX3	T	C
rs1002149	GSR	G	T
rs1056806	GSTM1	C	T
rs7483	GSTM3	C	T
rs1695	GSTP1:1105V	A	G
rs1805087	MTR	A	G
rs1208	NAT2	A	G
rs4998557	SOD1	G	A
rs4880	SOD2	A	G
rs2855262	SOD3	T	C

Definitions

DETOXIFICATION	Detoxification enzymes are responsible for clearing environmental chemicals and metabolites from our body. Accumulation of these chemicals and by-products can damage intracellular biochemical functions. Alterations in these systems can have a significant negative effect on the nervous system and immune systems functions. These polymorphisms can result in decreased "quality of life" and even decreased "life-span".
AHCY	Adenosylhomocysteinase (AHCY) is an enzyme that breaks down S-adenosylhomocysteine (SAH) to homocysteine and adenosine. Polymorphisms in this gene will lead to lower levels of homocysteine and glutathione.
CTH	Glutathione production is dependent on the function of the enzyme cystathionine gamma-lyase (CTH). CTH converts cystathionine to cysteine. Individuals with mutations in the CTH gene are predicted to have decreased glutathione-mediated detoxification.
GPX3	The protein encoded by this gene belongs to the glutathione peroxidase family which catalyze the reduction of organic hydroperoxides and hydrogen peroxide (H ₂ O ₂) by glutathione. This reduction functions to protect cells against oxidative damage. The GPX3 isozyme is secreted and is abundantly found in plasma, as well as intracellularly. Down regulation of expression of this gene by promoter hypermethylation has been observed in a wide spectrum of human disease states.
GSR	The glutathione reductase (GSR) gene encodes a protein involved in metabolizing glutathione. Mutations in this gene are associated with impaired cellular redox homeostasis.
GSTM1	Glutathione S-transferase M1 (GSTM1) is an important enzyme in the body's detoxification pathway. GSTM1 conjugates glutathione to molecules (drugs, environmental toxins, carcinogens etc.) bound for excretion. GSTM1 is mainly responsible for binding toxins in joints and for binding carcinogens.
GSTM3	Glutathione S-transferase mu 3 is an enzyme that detoxifies drugs, environmental toxins, and carcinogens by conjugating toxins to glutathione and subsequent excretion by the kidneys. Mutations in GSTM3 are associated with decreased clearance of toxins, anesthetics and drugs from the nervous system.
GSTP1	Glutathione S-transferases (GSTs) are a family of enzymes that play an important role in detoxification. The glutathione S-transferase pi gene (GSTP1) functions in chemical clearance and anti-inflammatory properties. High concentration of GST-p are found in the skin, lungs, sinuses, bladder and the intestinal tract. Polymorphisms of this enzyme allow for increased inflammatory activity in these areas that include eczema, asthma, chronic sinusitis, IBS, "leaky" gut and interstitial cystitis.
NAT2	N-Acetyl Transferase 2 (NAT2) is a liver enzyme that functions to both activate and deactivate drugs and carcinogens. Polymorphisms in this gene are divided into rapid, intermediate, and slow acetylator phenotypes. The slow polymorphism phenotype of NAT2 are also associated with higher incidences of cancer and drug toxicity.
SOD1	The protein encoded by this gene binds copper and zinc ions and is one of two isozymes responsible for destroying free superoxide radicals in the body. The encoded isozyme is a soluble cytoplasmic protein, acting as a homodimer to convert naturally-occurring, but harmful superoxide radicals to molecular oxygen and hydrogen peroxide. The other isozyme is a mitochondrial protein. Mutations in this gene have been implicated as causes of familial amyotrophic lateral sclerosis. Rare transcript variants have been reported for this gene
SOD2	Mitochondrial Superoxide Dismutase 2 (SOD2) is a member of the iron/manganese mitochondrial superoxide dismutase family. This protein transforms toxic superoxide, a byproduct of the mitochondrial electron transport chain, into hydrogen peroxide and oxygen. This function allows SOD2 to clear mitochondrial reactive oxygen species (ROS) and, as a result, confer protection against mitochondrial damage and cell death.
SOD3	Cytoplasmic Superoxide Dismutase 3 (SOD3) is a member of the superoxide dismutase family. This protein transforms toxic superoxide, a byproduct of certain cellular functions, into hydrogen peroxide and oxygen. This function allows SOD2 to clear and confer protection against mitochondrial damage and cell death.
METHYLATION	Methylation is a primary biochemical process in the body that involves the addition of a "methyl" chemical group to a vitamin or neurotransmitter. The addition of the "methyl" group allows for very specific biochemical interactions. Poor "methylation" function alters the effectiveness, delivery and function of many vitamins and important chemicals in the cell.
MTR	MTR (Methionine Synthase) codes for the enzyme that catalyzes the final step in methionine biosynthesis. Polymorphisms in this gene lead to poor recycling of methionine from homocysteine. This enzyme work in coordination with MTRR and requires both MTHF and B12 for proper functioning. Deficiencies in Methionine leads to poor methylation that is associated with numerous neurological, cardiovascular and immunological disease states, as well as, infertility and birth defects.

Disclaimers

TESTING:

Testing Performed By: TY

METHODOLOGY AND LIMITATIONS:

Testing for genetic variation/mutation on listed genes was performed using ProFlex PCR and Real-Time PCR with TaqMan® allele-specific probes on the QuantStudio 12K Flex. All genetic testing is performed by GX Sciences, 4150 Freidrich Lane, Ste H, Austin, TX. 78744. This test will not detect all the known alleles that result in altered or inactive tested genes. This test does not account for all individual variations in the individual tested. Test results do not rule out the possibility that this individual could be a carrier of other mutations/variations not detected by this gene mutation/variation panel. Rare mutations surrounding these alleles may also affect our detection of genetic variations. Thus, the interpretation is given as a probability. Therefore, this genetic information shall be interpreted in conjunction with other clinical findings and familial history for the administration of specific nutrients. Patients should receive appropriate genetic counseling to explain the implications of these test results. Details of assay performance and algorithms leading to clinical recommendations are available upon request. The analytical and performance characteristics of this laboratory developed test (LDT) were determined by GX Sciences' laboratory pursuant to Clinical Laboratory Improvement Amendments (CLIA) requirements.

CLIA #: 45D2144988 Laboratory Director: James Jacobson, PhD

DISCLAIMER:

This test was developed and its performance characteristics determined by GX Sciences. It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA and qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. rsIDs for the alleles being tested were obtained from the dbSNP database (Build 142).

DISCLAIMER:

UND Result: If you have received the result Variant undetermined (UND) this indicates that we were not able to determine your carrier status based on your raw data. Please refer to the GX Sciences genetic knowledge database for more information: https://www.gxsciences.com/kb_results.asp

DISCLAIMER:

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DISCLAIMER:

These products are not approved by the Food and Drug Administration and are not intended to diagnose, treat, cure or prevent disease. These recommendations are for report purposes only and an individual is not required to use such products. These are recommendations only and do not replace the advisement of your own healthcare practitioner.

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METHYLATION SNP References

MTR

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